

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-41 (Cancelled)

42. (New) A cartridge comprising:

a) a reaction chamber comprising:

i) a substrate comprising an array of electrodes, each comprising:

A) a self-assembled monolayer; and

B) a capture binding ligand covalently attached to said

electrode;

ii) an inlet port positioned at the bottom of the reaction chamber for the introduction of reagents;

iii) an outlet port positioned at the top of the reaction chamber, and

b) interconnects to allow the electrical connection of said electrodes to a processor.

43. (New) A cartridge according to claim 42, wherein the inlet port and the outlet port are separated.

44. (New) A cartridge according to claim 42,, wherein the inlet port connects to the outlet port.

45. (New) A cartridge comprising:

a) a reaction chamber comprising:

i) a substrate comprising a printed circuit board comprising an array of electrodes, each electrode comprising:

A) a self-assembled monolayer; and

B) a capture binding ligand covalently attached to said electrode;
ii) an inlet port for the introduction of reagents; and
b) interconnects to allow the electrical connection of said electrodes to a processor.

46. (New) A cartridge according to claim 45, wherein at least one of the electrodes is on a surface of the printed circuit board.

47. (New) A cartridge according to claim 45, wherein at least one of the electrodes is fabricated on the printed circuit board.

48. (New) A cartridge according to claim 42 or 45, wherein said inlet port comprises a semipermeable membrane filter.

49. (New) A cartridge comprising:
a) a reaction chamber comprising:
i) a substrate comprising an array of electrodes, each electrode comprising:
A) a self-assembled monolayer; and
B) a capture binding ligand covalently attached to said electrode;
ii) an inlet port for the introduction of reagents, said inlet port comprising a semipermeable membrane filter; and
b) interconnects to allow the electrical connection of said electrodes to a processor.

50. (New) A cartridge according to claim 49, wherein said semipermeable membrane comprises polytetrafluoroethylene.

51. (New) A cartridge according to claim 49, wherein said semipermeable membrane comprises expanded-polytetrafluoroethylene.

52. (New) A cartridge according to claim 42 or 49 wherein said substrate comprises a printed circuit board.

53. (New) A cartridge according to claim 42, 45 or 49, wherein said capture binding ligands comprise nucleic acids.

54. (New) A cartridge according to claim 42, 45 or 49, wherein said reaction chamber further comprises a gasket to retain fluid in contact with said array.

55. (New) A cartridge according to claim 42, 45 or 49, wherein said reaction chamber further comprises an outlet port.

56. (New) A cartridge according to claim 42, 45 or 49, wherein said array is on one surface of said substrate.

57. (New) A cartridge according to claim 42, 45 or 49, wherein two surfaces of said substrate each comprise an array.

58. (New) A cartridge according to claim 42, 45 or 49, further comprising a cap comprising at least one storage well comprising assay reagents.

59. (New) A cartridge according to claim 58, wherein the cap is removable.

60. (New) A cartridge according to claim 42, 45 or 49, wherein said capture binding ligands comprise proteins.

61. (New) A cartridge according to claim 42, 45 or 49, further comprising an assay complex on at least one of said electrodes, said assay complex comprising at least one of said capture binding ligands, a target analyte, and an electron transfer moiety.

62. (New) A cartridge according to claim 42, 45 or 49, wherein the self-assembled monolayer comprises a conductive oligomer.

63. (New) A cartridge according to claim 42, 45 or 49, wherein at least one of the electrodes comprises gold.

64. (New) A cartridge according to claim 42, 45 or 49, wherein the self-assembled monolayer comprises a thiol-containing monolayer forming species.

65. (Withdrawn) A method for filling a reaction chamber comprising:
providing a cartridge comprising a reaction chamber, an inlet port positioned at the bottom of the reaction chamber, and an outlet port positioned at the top of the reaction chamber;
introducing a fluid into the inlet port positioned at the bottom of the reaction chamber;
allowing escape of gas through the outlet port at the top of the reaction chamber, thereby filling the reaction chamber without introducing a bubble into the reaction chamber.